

**Attachment I**

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of claims:**

1. (Original) A semiconductor device, comprising:
  - a drain electrode;
  - a source electrode;
  - a channel contacting the drain electrode and the source electrode, wherein the channel includes gallium oxide;
  - a gate electrode; and
  - a gate dielectric positioned between the gate electrode and the channel.
2. (Original) The semiconductor device of claim 1, wherein gallium oxide includes a single-phase crystalline form selected from the group consisting of GaO, Ga<sub>2</sub>O, and Ga<sub>2</sub>O<sub>3</sub>.
3. (Original) The semiconductor device of claim 1, wherein gallium oxide includes a single-phase crystalline form of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>.
4. (Original) The semiconductor device of claim 1, wherein gallium oxide includes a mixed-phase crystalline form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.
5. (Original) The semiconductor device of claim 4, wherein gallium oxide includes GaO:Ga<sub>2</sub>O:Ga<sub>2</sub>O<sub>3</sub> in a ratio of A:B:C, wherein A, B, and C are each in a range of about 0.025 to about 0.95.
6. (Original) The semiconductor device of claim 1, wherein gallium oxide includes an amorphous form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.

7. (Original) The semiconductor device of claim 1, wherein the channel includes being positioned between and electrically coupling the drain electrode and the source electrode.

8. (Original) The semiconductor device of claim 1, wherein at least one of the drain electrode, the source electrode, the channel, and gate electrode, and the gate dielectric are substantially transparent.

9. (Original) A semiconductor device, comprising:

    a drain electrode;  
    a source electrode;  
    means for a channel to electrically couple the drain electrode and the source electrode;  
    a gate electrode; and  
    a gate dielectric positioned between the gate electrode and the channel.

10. (Original) The semiconductor device of claim 9, wherein the means for a channel includes means for a single-phase crystalline form selected from the group consisting of GaO, Ga<sub>2</sub>O, and Ga<sub>2</sub>O<sub>3</sub>.

11. (Original) The semiconductor device of claim 9, wherein the means for a channel includes a single-phase crystalline form of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>.

12. (Original) The semiconductor device of claim 9, wherein the means for a channel includes means for forming a mixed-phase crystalline form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.

13. (Original) The semiconductor device of claim 9, wherein the means for a channel includes means for forming an amorphous form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.

14. (Original) The semiconductor device of claim 9, wherein at least one of the drain electrode, the source electrode, the channel, and gate electrode, and the gate dielectric are substantially transparent.

15. - 27. (Canceled)

28. (Original) A semiconductor device formed by the steps, comprising:

- providing a drain electrode;
- providing a source electrode;
- providing a precursor composition including one or more compounds of a gallium precursor compound;
- depositing a channel of gallium oxide from the precursor composition to contact the drain electrode and the source electrode;
- providing a gate electrode; and
- providing a gate dielectric positioned between the gate electrode and the channel.

29. (Original) The semiconductor device of claim 28, wherein depositing the channel includes:

- vaporizing the precursor composition to form vaporized precursor composition; and
- depositing the vaporized precursor composition using a physical vapor deposition technique.

30. (Original) The semiconductor device of claim 28, wherein the physical vapor deposition technique includes one or more of dc sputtering, rf sputtering, magnetron sputtering, and ion beam sputtering.

31. - 33. (canceled)

34. (Original) A display device, comprising:

a plurality of display elements configured to operate collectively to display images, where each of the display elements includes a semiconductor device configured to control light emitted by the display element, the semiconductor device including:

a drain electrode;

a source electrode;

a channel contacting the drain electrode and the source electrode,

wherein the channel includes gallium oxide;

a gate electrode; and

a gate dielectric positioned between the gate electrode and the channel and configured to permit application of an electric field to the channel.

35. (Original) The display device of claim 34, wherein gallium oxide includes a single-phase crystalline form selected from the group consisting of GaO, Ga<sub>2</sub>O, and Ga<sub>2</sub>O<sub>3</sub>.

36. (Original) The display device of claim 34, wherein gallium oxide includes a single-phase crystalline form of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>.

37. (Original) The display device of claim 34, wherein gallium oxide includes a mixed-phase crystalline form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.

38. (Original) The display device of claim 37, wherein gallium oxide includes GaO:Ga<sub>2</sub>O:Ga<sub>2</sub>O<sub>3</sub> in a ratio of A:B:C, wherein A, B, and C are each in a range of about 0.025 to about 0.95.

39. (Original) The display device of claim 34, wherein gallium oxide includes an amorphous form from compounds selected from the group consisting of GaO, Ga<sub>2</sub>O, Ga<sub>2</sub>O<sub>3</sub>, and mixtures thereof.

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40. (Original) The display device of claim 34, wherein at least one of the drain electrode, the source electrode, the channel, and gate electrode, and the gate dielectric are substantially transparent.